9/28/2004

Patent Application

Application #: 10/707,239
Group Art Unit # 3712
Filing Date: 11/30/2003
Examiner: Dmitry Suhol
Title: Teaching Cylinder Instrument

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Name Gerald Bauldock

Signature Gerald Bauldock

Date 9/30/04

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Letter for Reconsideration,

I, Gerald Bauldock, am requesting that my application for a Teaching Cylinder Instrument patent (application # 10/707,239) be reconsidered with the following amendments that resulted from requests in the Notice of Allowance dated 8/9/04. The amendments are as follows:

1) The original Brief Description of Drawings has been modified as a result of requests in the notice of allowance.
2) The original Detailed Description has been modified as a result of requests in the notice of allowance.
3) The original Figures have been modified as requested in the notice of allowance.

Gerald Bauldock

Gerald Bauldock

SPECIFICATION

[Electronic Version 1.2.8]

Teaching Cylinder Instrument

Background of Invention

[0001] 1) Field of the invention.

[0002] The invention relates to devices that teach the relationship between a cylinder's surface areas and volume, its diameter and radius, the top circle circumference and area, the arc length, the sector area, the volume of a slice, the front area of the slice and the side area of the slice.

[0003] Across the nation, schools are going through a major reform in their math and science curriculum to bring education standards up to par. The facts show that there is an achievement gap between blacks and whites in mathematics and science. In 1999, when the latest National Assessment of Education Progress (NAEP) test was administered, large differences remained between average scores for blacks and Hispanics on the one hand, versus whites and Asians on the other. Nationally, the achievement gap did not narrow at all during the 1990s. In reading and math, gaps separating poor and minority students from others actually widened at most grade levels and remained the same or dropped only slightly at others (The Education Trust). By the end of grade 4, African American, Latino and poor students of all races are already about two years behind other students. By the time they reach grade 8, they are about three years behind. By the time they reach grade 12, if they do so at all, minority students are about four years behind other young people. The mathematics and science skills of 17-year-old African American and Latino students are similar to those of 13-year-old white students. African Americans and Latinos obtain college degrees at only half the rate of white students. The partnerships between government agency, industry, academia and private organizations are trying to address these issues along with many others. This invention provides a method for teaching the geometric concepts of a cylinder and the equations involved.

[0004] 2) Prior Art. The prior art consists of teaching the theory and equations for the geometry of a cylinder and its parts. Lessons primarily consist of a mathematical explanation for the following:1) The circumference of a circle $C = \pi D$ or $C = 2\pi r$, 2) The area of a circle $A = \pi r^2$, 3) The arc length = $2 \pi r \theta/360$, 4) The sector area = $\pi r^2 \theta/360$, 5) The volume of a cylinder = $\pi r^2 L$, 6) The volume of a slice = $\pi r^2 L \theta/360$, 7)

The front surface area of a cylinder is $2\pi rL$, 8) The front surface area of a slice = $2\pi rL\ \theta/360$, 9) And the side surface area of a slice = r L.

[0005] The present invention, as distinguished from the prior art, provides a device that clearly demonstrates the relationship between a cylinder, its diameter and radius, the arc length, the sector area, the volume of a slice, the front area of the slice and the side area of the slice. None of the prior art uses a device or tool that includes a hollow outer half-cylinder, and a solid inner half-cylinder that can rotates around a common center for both the inner and outer half-cylinders. And none of the prior art contains individual slices that can be attached to the inner half cylinder to complete a full 360 degrees cylinder.

Summary of Invention

[0006] The present invention is designed to teach the relationship between a cylinder's surface areas and volume, its diameter and radius, the top circle circumference and area, the arc length, the sector area, the volume of a slice, the front area of the slice and the side area of the slice.

[0007] One of the objectives of the present inventions is to provide a device that will bring the level of learning and understanding of a cylinder's geometry and its equations to a conceptual level rather than just a fact remembering level as described in the Blooms Taxonomy.

[0008] Another objective is to clearly teach the basic equations of a cylinder's top circle surface area and circumference, its front surface area, its volume and the relationship to the arc length, the sector area, and the areas and volume of a slice.

[0009] Another objective is to clearly show how the ratio of $\theta/360$ is common to determining values for the arc length, the sector area, the volume of a slice and the front surface area of a slice.

[0010] Another objective is to clearly show that the arc length is a fraction of the total circumference and that the fraction is determined by $\theta/360$.

[0011] Another objective is to clearly show that the sector area is a fraction of the total area of a circle and that the fraction is determined by $\theta/360$.

[0012] Another objective is to clearly show that the volume of a slice is a fraction of the volume of the cylinder and that the fraction is determined by $\theta/360$.